

AMENDMENTS TO THE DRAWINGS

Please amend **Figure 3A** as shown on the accompanying **Replacement Sheet**.

REMARKS

The Applicants have studied the non-final *Office Action* mailed February 22, 2006, and have made amendments to the drawings, specification, and claims. It is respectfully submitted that the application, as amended, is in condition for allowance. By virtue of these amendments, claims 1-42 are pending in the application. Claims 1-42 are rejected. Claims 1, 5, 10, 12, 14-16, 19-20, 22, 24-25, 27, 29-36, and 38-42 have been amended. No new matter has been added. The Examiner's rejections are addressed below in substantially the same order as in the non-final *Office Action* mailed February 22, 2006. The Applicants respectfully request reconsideration and allowance of the claims in view of the above amendments and the following remarks.

A replacement drawing page has been provided herewith, including the reference number 318 in **Figure 3A**, thereby conforming the drawings to the specification in paragraph [0024] (which corresponds to paragraph [0032] in the published Patent Application No. 20050184260, published on August 25, 2005) where "A low power ASIC 316 provides digital signal output 318" is described. No new matter has been added.

A minor typographical correction has been made in the specification, correcting the second occurrence of "FIG. 3A" in paragraph [0016] (which corresponds to the paragraphs [0016]-[0024] in the published Patent Application No. 20050184260, published on August 25, 2005) to be "FIG. 3C." No new matter has been added.

REJECTIONS UNDER 35 USC §102

Claims 1-4, 9, 11-12, 14-19, 24, 26-27, 29-33, 35, 37-40, and 42 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,675,674 to Weis ("the *Weis* patent"). These rejections are respectfully traversed.

With respect to claims 1-4, 9, 11-12, 14-19, 24, 26-27, 29-33, 35, 37-40, and 42, the Examiner has identified the active array relying on power conductors to provide power from a central source to electronics distributed throughout the active array, the distributed electronics requiring power for converting electrical signals to *analog optical signals* and for signal conditioning, the *analog optical signals* being transmitted along the optical fiber using

interferometrics without the desired bandwidth for some seismic applications and requiring an expensive and complex central recording system to *demultiplex* the *analog* optical signals in order to acquire the desired seismic data, as shown in Figures 1 and 6, and as described at col. 15, in the *Weis* patent, for example, as being relevant to “transmitting *digital* information in a seismic data acquisition system,” “a transducer for providing the *digital* information comprising *digital* optical data signals *transmitting multi-bit words using modulation* by acting on an optical carrier,” and “an optical interrogator coupled to the optical carrier for retrieving the *digital* information comprising the *digital* optical data signals from the optical carrier,” as recited in claim 1, as amended. The non-final *Office Action* mailed February 22, 2006, page 2. However, as described, for example, in the *Weis* patent col. 15, lines 15-18 (emphasis added), “if the *output* of sensor 331 is *digital*, modulator 333 can be a *voltage controlled switch* that is opened or closed depending upon the *digital* state of the sensor 331,” modulating the *digital* sensor output using *additional* sinusoidal carrier frequencies generated by *multiple* oscillators, with the resulting wavelength division *multiplexed analog* optical signals generated by the wavelength division *multiplexed* Bragg grating piezoelectric crystal (PZ) assembly then *transmitted* through the optical fiber to the Mach-Zehnder (MZ) *interferometer* where *multiple* bandpass filters and processors are still needed to *demultiplex* the *analog* optical signals in order to acquire the desired seismic data.

Moreover, the *Weis* patent does not disclose, teach, or suggest transmitting *digital* information in a seismic data acquisition system using a transducer for providing the *digital* information comprising *digital* optical data signals *transmitting multi-bit words using modulation* by acting on an optical carrier and an optical interrogator coupled to the optical carrier for retrieving the *digital* information comprising the *digital* optical data signals from the optical carrier. However, claim 1, as amended, recites “transmitting *digital* information in a seismic data acquisition system,” “a transducer for providing the *digital* information comprising *digital* optical data signals *transmitting multi-bit words using modulation* by acting on an optical carrier,” and “an optical interrogator coupled to the optical carrier for retrieving the *digital* information comprising the *digital* optical data signals from the optical carrier” (emphasis added). Claims 16, 31, 38, and 40, as amended, have similar recitations. Therefore, it is respectfully requested that the

rejection of claims 1, 16, 31, 38, and 40, and claims 2-4, 9, 11-12, 14-15, 17-19, 24, 26-27, 29-30, 32-33, 35, 37, 39, and 42, which depend therefrom, under 35 U.S.C. §102(b), be withdrawn.

REJECTIONS UNDER 35 USC §103

Claims 5-8, 10, 13, 20-23, 25, 28, 34, 36, and 41 are rejected under 35 USC §103(a) as being unpatentable over the *Weis* patent. These rejections are respectfully traversed.

With respect to claims 5-8, 10, 13, 20-23, 25, 28, 34, 36, and 41, the Examiner admits that the *Weis* patent lacks clear teachings of “the digital optical data signals include symbol data indicative of the modulated properties of the modulated optical carrier,” “the modulated property includes amplitude,” “a mirror and/or a micro-machined mirror for reflecting the optical carrier,” “a liquid crystal device,” “one or more sensors operate in a low power state,” “a micro-machined reflector,” and “the transducer activates and/or deactivates the controllable light source in response to the first signal to convert the first signal to the digital optical signal.” The non-final *Office Action* mailed February 22, 2006, pages 5-7. The Applicants respectfully agree.

More importantly, however, for all the reasons given above, the *Weis* patent does not disclose, teach, or suggest transmitting ***digital information*** in a seismic data acquisition system using a transducer for providing the ***digital information*** comprising ***digital optical data signals transmitting multi-bit words using modulation*** by acting on an optical carrier and an optical interrogator coupled to the optical carrier for retrieving the ***digital information*** comprising the ***digital optical data signals*** from the optical carrier. However, claim 1, as amended, recites “transmitting ***digital information*** in a seismic data acquisition system,” “a transducer for providing the ***digital information*** comprising ***digital optical data signals transmitting multi-bit words using modulation*** by acting on an optical carrier,” and “an optical interrogator coupled to the optical carrier for retrieving the ***digital information*** comprising the ***digital optical data signals*** from the optical carrier” (emphasis added). Claims 16, 31, 38, and 40, as amended, have similar recitations.

Further, it is respectfully submitted that it would not have been obvious to modify the *Weis* patent cited by the Examiner. It is well-settled that a reference **must** provide **some motivation or reason** for one skilled in the art (working **without** the benefit of **hindsight reconstruction** using the applicants’ specification) to make the necessary changes in the disclosed device or method. The

mere fact that a reference may be modified in the direction of the claimed invention does not make the modification obvious unless the reference *expressly* or *impliedly* teaches or suggests the *desirability* of the modification. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984); *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. App. 1985); *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. App. 1984). Indeed, the Federal Circuit stated:

... To draw on **hindsight knowledge** of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a **template** for its own **reconstruction**--an **illogical** and **inappropriate** process by which to determine patentability. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed **not** after the **blueprint** has been **drawn by the inventor**, but as it would have been perceived in the state of the art that existed at the time the invention was made. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

Sensonics Inc. v. Aer sonic Corp., 38 USPQ2d 1551, 1554 (Fed. Cir. 1996) (emphasis added).

The *Weis* patent fails to meet the basic requirement for a finding of obviousness established by the courts in *Sensonics*, *Gordon*, *Clapp*, and *Chicago Rawhide*. There is no **suggestion** in the *Weis* patent of modifying the devices or methods disclosed therein in the direction of the present invention, nor is there any **suggestion** of the *desirability* of such modifications (*i.e.*, transmitting **digital information** in a seismic data acquisition system using a transducer for providing the **digital information** comprising **digital optical data signals transmitting multi-bit words using modulation** by acting on an optical carrier and an optical interrogator coupled to the optical carrier for retrieving the **digital information** comprising the **digital optical data signals** from the optical carrier). Thus, it is respectfully submitted that the ordinarily skilled artisan would have had no motivation to modify the reference as suggested by the Examiner. Therefore, for all the above reasons, it is respectfully requested that the rejection of claims 1, 16, 31, 38, and 40, and claims 5-8, 10, 13, 20-23, 25, 28, 34, 36, and 41, that depend therefrom, under 35 U.S.C. §103(a), be withdrawn.

CONCLUSION

For all the foregoing reasons, the Applicants submit that the application is in a condition for allowance. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Houston, Texas telephone number (713) 266-1130 x 123 to discuss the steps necessary for placing the application in condition for allowance. No additional fee, beyond the **\$120.00** fee for Petition for the one-month Extension of Time mentioned above, is believed due for this paper. The Commissioner is hereby authorized to charge any additional fees, or credit any overpayment, to Deposit Account No. **13-0010 (IO-1091US)**.

Respectfully submitted,



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